Space Weather Forecast

Issued on Sunday, 08 October 2023 at 13:28 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate-class flares throughout. Chance of G1/Minor Storm intervals 09-11 Oct.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar Activity is Moderate with an isolated Moderate class flare observed at 07/1807 UTC, from a spot in the southeast. Nine sunspot regions feature on the visible disc with two unnumbered. One in the northwest is large and magnetically complex. The previously mentioned spot in the southeast is the next most complex region, now with moderate magnetic complexity and shows signs of growth and proliferation of intermediate spots. This spot is responsible for a C5 flare at 08/0339 UTC, which gave a partial halo coronal mass ejection that likely has an Earth directed component. The remaining regions all appear to be small and mostly simple at present.

Solar Wind / Geomagnetic Activity: Solar winds have been at slow-ambient levels. Total magnetic field strength has been weak. The north-south component varied weakly. Geomagnetic activity has been Quiet (Kp 0-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background levels, with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to remain at Low to Moderate levels, with the greatest chance of a further Moderate level flare probably coming from the two larger regions in the northwest of the disc, and perhaps also from the newly emerging region in the southeast, which has the rather unusual magnetic structure which favours enhanced flare activity.

Solar Wind / Geomagnetic Activity: Two potential coronal mass ejections feature in the forecast. One from 05 Oct and one from 08 Oct, potentially arriving day 2 (09 Oct) and day 4 (11 Oct) respectively. Solar winds are expected to remain at slow-ambient levels until the High Speed Streams of successive coronal holes arrive at Earth later on day 2 (09 Oct) and into day 3 (10 Oct), with solar winds perhaps reaching elevated levels.

Geomagnetic activity is expected to be Quiet to Unsettled initially. Unsettled to Active geomagnetic activity is then likely to predominate from day 2 onward (09-11 Oct), with a daily chance G1/Minor storm periods due to either coronal mass ejection arrivals or coronal hole high speeds streams.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is most likely to remain at background levels, with a very low risk of enhancements from the current sunspots on the disc.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	30	30	30
Strong	G3	No	1	2	2	2
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	50	50	50	50
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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